

## CLAIMS

- 1 1. An electrostatic particulate collection apparatus mounted in a fluid stream containing  
2 particulate matter, the apparatus comprising:
  - 3 a) a first substantially planar screen mounted in the fluid stream transverse to a fluid  
4 stream flow direction, said first screen having an electrical charge sufficient to  
5 create a corona and a plurality of openings smaller than about three millimeters;
  - 6 b) a second substantially planar screen mounted in the fluid stream transverse to the  
7 fluid stream flow direction and spaced from the first screen less than about 10  
8 millimeters, said second screen having a plurality of openings smaller than about  
9 three millimeters and an electrical charge of the same polarity as the first screen's  
10 electrical charge and sufficient to create a corona; and
  - 11 c) a collector below at least one of the screens for receiving particulate.
- 1 2. The electrostatic particulate collection apparatus in accordance with claim 1, further  
2 comprising an array of substantially planar screens mounted in the fluid stream transverse  
3 to the fluid stream flow direction, spaced less than about 10 millimeters from said second  
4 screen, and each of the screens in said array having a plurality of openings smaller than  
5 about three millimeters and an electrical charge of the same polarity as the first screen's  
6 electrical charge and sufficient to create a corona.

- 1    3. The electrostatic particulate collection apparatus in accordance with claim 2, wherein  
2    the openings in the first and second screens are about one millimeter.
- 1    4. The electrostatic particulate collection apparatus in accordance with claim 3, wherein  
2    the distance between the first and second screens is less than about five millimeters.
- 1    5. The electrostatic particulate collection apparatus in accordance with claim 4, wherein  
2    the collector has an electrical charge of opposite polarity to the first and second screens.
- 1    6. The electrostatic particulate collection apparatus in accordance with claim 5, wherein  
2    the fluid stream has a fluid velocity through the screens of less than 10 meters per second.
- 1    7. The electrostatic particulate collection apparatus in accordance with claim 2, wherein  
2    the screens are substantially perpendicular to the fluid stream flow direction and  
3    substantially parallel to one another.
- 1    8. The electrostatic particulate collection apparatus in accordance with claim 2, wherein  
2    the distance between the first and second screens is greater than the distance between at  
3    least two downstream screens in the array.

1 9. The electrostatic particulate collection apparatus in accordance with claim 2, wherein  
2 the openings in the first and second screens are larger than the openings in at least one  
3 downstream screen in the array.

1 10. The electrostatic particulate collection apparatus in accordance with claim 8, wherein  
2 the openings in the first and second screens are larger than the openings in at least one  
3 downstream screen in the array.

1 11. The electrostatic particulate collection apparatus in accordance with claim 10,  
2 wherein the screens are woven wires.

1 12. The electrostatic particulate collection apparatus in accordance with claim 11,  
2 wherein the wires are stainless steel.

1 13. An electrostatic particulate collection apparatus mounted in a fluid stream containing  
2 particulate matter, the apparatus comprising:

- 3 a) a first substantially planar screen mounted in the fluid stream transverse to a fluid  
4 stream flow direction, said first screen having an electrical charge sufficient to  
5 create a corona and a plurality of openings smaller than about three millimeters;  
6 b) a second substantially planar screen mounted in the fluid stream transverse to the  
7 fluid stream flow direction and spaced from the first screen at least about one-half

8 of an inch, said second screen having a plurality of openings smaller than about  
9 three millimeters and an electrical charge of different polarity from the first  
10 screen; and

11 c) a first collector below the first screen and a second collector below the second  
12 screen for receiving particulate from the respective screens.

1 14. The electrostatic particulate collection apparatus in accordance with claim 13, further  
2 comprising an array of substantially planar screens mounted in the fluid stream transverse  
3 to the fluid stream flow direction, spaced at least about one inch from said second screen,  
4 and each of the screens in said array having a plurality of openings smaller than about  
5 three millimeters and an electrical charge of the same polarity as one of the screens'  
6 electrical charges.

1 15. The electrostatic particulate collection apparatus in accordance with claim 14, further  
2 comprising an array of collectors mounted below the array of screens for receiving  
3 particulate from respective screens in the array and keeping separate the particulate from  
4 some of the screens in the array from the particulate from others of the screens in the  
5 array.

1 16. The electrostatic particulate collection apparatus in accordance with claim 15,  
2 wherein the openings in the first and second screens are about one millimeter.

1 17. The electrostatic particulate collection apparatus in accordance with claim 16,  
2 wherein the first collector has an electrical charge of opposite polarity to the first screen  
3 and the second collector has an electrical charge of opposite polarity to the second screen.

1 18. The electrostatic particulate collection apparatus in accordance with claim 17,  
2 wherein the fluid stream has a fluid velocity through the screens of less than 10 meters  
3 per second.

4 19. The electrostatic particulate collection apparatus in accordance with claim 15,  
5 wherein the screens are substantially perpendicular to the fluid stream flow direction.

1 20. The electrostatic particulate collection apparatus in accordance with claim 15,  
2 wherein the distance between the first and second screens is greater than the distance  
3 between at least two downstream screens in the array.

1 21. The electrostatic particulate collection apparatus in accordance with claim 15,  
2 wherein the openings in the first and second screens are larger than the openings in at  
3 least one downstream screen in the array.

1 22. The electrostatic particulate collection apparatus in accordance with claim 20,  
2 wherein the openings in the first and second screens are larger than the openings in at  
3 least one downstream screen in the array.

1 23. The electrostatic particulate collection apparatus in accordance with claim 22,  
2 wherein the screens are woven of wire.

1 24. The electrostatic particulate collection apparatus in accordance with claim 23,  
2 wherein the wire is stainless steel.